



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6  
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DALLAS TX 75202-2733

APR 02 2013

Mr. David Keith  
Project Coordinator  
Anchor QEA, LLC  
614 Magnolia Avenue  
Ocean Springs, MS 39654

RE: Draft Remedial Investigation Report  
San Jacinto River Waste Pits Superfund Site, Harris County, Texas  
Unilateral Administrative Order, CERCLA Docket No. 06-03-10

Dear Mr. Keith:

The Environmental Protection Agency (EPA) and other agencies have performed reviews of the above referenced document dated December 2012. The EPA approves this document with the enclosed modifications.

Please provide copies of the final document to the distribution list. If you have any questions, please contact me at (214) 665-8318, or send an e-mail message to [miller.garyg@epa.gov](mailto:miller.garyg@epa.gov).

Sincerely yours,

A handwritten signature in black ink, appearing to read "Gary Miller", is written over a horizontal line.

Gary Miller  
Remediation Project Manager

Enclosure

cc: Luda Voskov (TCEQ)  
Bob Allen (Harris County)  
Linda Henry (Port of Houston)  
Jane Sarosdy (TGLO)

## **Comments**

### **Draft Remedial Investigation (RI) Report dated December 2012**

1. (General): The RI Report shall include a discussion of why the species sampled for tissue concentrations are representative of other species that may be consumed and impact human health risk.
2. (General): Several acronyms are not defined at the first use in the text. All acronyms shall be defined at their first use in the text. Also, the acronym list shall include "QC", which is used in the text.
3. (Section 2, p. 2-1): It was stated that "no historical chemistry data for soil, groundwater, or air from locations within USEPA's Preliminary Site Perimeter were found..." The statement is not correct. The historical chemistry data for soil and sediment are available from the USEPA and TCEQ Screening Site Assessment (September 2006) and the HRS Documentation Record (September 2007). Additional historical data for sediment and soil are available from the Texas Department of Transportation (Weston, 2006; Draft Field Activities Report for Sediment Sampling; San Jacinto River Bridge Dolphin Project IH-10 at the San Jacinto River). The report shall be revised to recognize this.
4. (Section 2.1.1.6, p. 2-15): Information gathered from the TCRA Cap porewater sampling event will not address the long-term effectiveness of the cap to prevent the release of dioxins and furans from the area within the 1966 perimeter. Only long-term monitoring will do this. The sampling completed will not address any potential releases resulting from future erosional forces, for example. The discussion states that this pore water study was intended to address uncertainties associated with the potential for transport of dioxins and furans detected in perched water within the waste in the impoundments north of I-10 into surface water. However, this uncertainty still exists for the long term. The report shall be revised to discuss this long term uncertainty.
5. (Section 2.1.1.6, p. 2-15): The report shall include a reference to the study that was conducted to address uncertainties about the potential for transport of dioxins and furans detected in perched water within the waste in the impoundments north of I-10 into surface water.
6. (Section 2.1.2, p. 2-20): The report shall provide the particular section(s) where the results of sampling conducted according to Sediment SAP Addenda 1 and 2 were presented.
7. (Section 2.1.2.2, p. 2-22): The report shall provide the particular section(s) where the results of sampling conducted according to Tissue SAP Addenda 1 are presented.
8. (Section 2.1.2.3, p. 2-23): The report shall include text references to the figures showing locations of soil investigations.
9. (Section 2.1.2.3, p. 2-23): The report shall correct the description of the groundwater monitoring well locations from "in the western cell of the northern impoundments" to the berms surrounding the northern impoundments".
10. (Section 2.1.2.4.2, p. 2-26): The reference for Miller 2011g is not listed in the reference list. This reference shall be added to list of the references.

11. (Section 2.1.2.4.2, p. 2-27): The report shall provide the particular section(s) where the results of groundwater sampling in the area south of I-10 are presented.
12. (Section 2.1.2.4.5, p. 2-27): The report shall provide the particular section(s) where the results of the TCRA armored cap porewater study are presented.
13. (Section 2.1.3.3, p. 2-31): The reference to "EPA 2009b", which describes the draft recommended preliminary remediation goals for dioxin, has been superseded by the final non-cancer dioxin reassessment released on February 17, 2012. The 2012 final non-cancer dioxin reassessment shall be used and referenced in the RI Report instead of the 2009 draft recommended preliminary remediation goals for dioxin.
14. (Section 2.1.3.3, p. 2-31): The text includes an "Anchor QEA 2012c" reference, but it is not listed in the Reference list. The Reference list shall be revised to include the reference, or the text revised as appropriate.
15. (Section 2.4.1, p. 2-45 and p. 2-46): The report shall provide additional discussion on the rationale for not including the data collected in 2005. For example, what was the statistically significant difference, and did the 2005 results show lower or higher numbers? The discussion shall indicate that the 2010 dioxin and furan concentrations were determined to be lower based on a variety of statistical analyses.
16. (Section 2.5.1, p. 2-48): The descriptions for the various TEQ bullets shall include "for mammals" to the end of each bullet. The TEQ definitions for birds and fish shall be added here as well.
17. (Section 3.3.1, p. 3-7): The 2001 fish advisory reference in the text is shown as "TDH 2001", but is shown in the Reference list as "TDH 2001b". This reference shall be corrected.
18. (Section 3.5.2, p. 3-14): In the "Gray silty sand" section, the "NAVD 88" acronym in the text shall be added to acronym list.
19. (Section 4.2, p. 4-5; and Section 4.5, p. 4-16): The discussion presents the background dataset only in terms of toxicity equivalency factors for mammals. Similarly, the various statistical comparisons present the chemicals of potential concern in terms of toxicity equivalency factors for mammals only. The discussion in the report shall also include statistical assessments in terms of toxicity equivalency factors for birds and fish, or provide an acceptable rationale for limiting the evaluation to mammals.
20. (Section 4.2.2, p. 4-7): The mean BEHP concentration in background surface sediment is shown to be "12" in text, but Table 4-6 lists the mean BEHP as "11". The report shall be corrected to show the correct concentrations.
21. (Section 4.3, p. 4-10): The discussion explains that the outlier analysis affects the calculation of exposure point concentrations for the baseline human health risk assessment. The discussion is silent on the potential impacts to the background analysis in the baseline ecological risk assessment. The report shall include additional explanation relative to the baseline ecological risk assessment.

22. (Section 4.3.4.2, p. 4-13): The text states ".....total PCBs with nondetects set to zero or set to one-half the detection limit...." An explanation shall be added that describes why values were set to zero.

23. (Section 4.5.3, p. 4-19): The last paragraph of this section closes with an unproven opinion regarding the source of COPCs that shall be deleted. The report may note that a number of sources, including the site, may contribute to the COPCs for the site. Any such statement shall include the specific COPCs and the specific sources, with supporting documentation and references.

24. (Section 4.5.3.2, p. 4-20): Additional discussion shall be added to discuss whole body catfish. Dioxins, PCBs, arsenic, and other compounds had significantly different values than background.

25. (Section 5.1, p. 5-3): The reference to TNRCC Docket No. "97-0453-IHW-E" shall be corrected to "1997-0453-IHW-E". In the next sentence the "hazardous material" shall be changed to "hazardous waste" as noted in the agreed order.

26. (Section 5.2.1.1.1, p. 5-8): The text provides an average concentration for 2,3,7,8-TCDF of 5,480 ng/kg, but Table 5-1 shows a mean of 6,680 ng/kg for 2,3,7,8- TCDF. The table or the text shall be corrected with the proper value.

27. (Section 5.2.1.1.2, p. 5-9): The text provides an average concentration for 2,3,7,8-TCDF of 15,300 ng/kg, but Table 5-2 shows a mean of 17,000 ng/kg for 2,3,7,8- TCDF. The table or the text shall be corrected with the proper value.

28. (Section 5.2.1.2.3, p. 5-12): Table 5-3 shall be referenced in this section.

29. (Section 5.2.2.5, p. 5-19): During the oversight activities, the TCEQ observed a completely saturated condition of the sediment/waste in the Northern Impoundment. The physical appearance of the sediment/waste was more like a "grayish silty muck". The report shall include a discussion or reference on how the hydraulic conductivity of the impoundment sediment/waste was measured.

30. (Section 5.2.3.1, p. 5-23): The fact that contaminant concentrations correlate with fine and organic carbon (OC) content is helpful. In reviewing the distribution maps (Figures 5-4, 6, 8), contaminant concentrations at several points appear to be anomalously high or low. If one marks the apparently anomalously low (or high) concentrations, they nearly all are at locations with low (or high) fines and/or organic carbon content. Figures 5-4, 6, and 8 shall be labeled to distinguish locations with high and low fines/OC, so that the distribution figures do not appear to show outliers, but instead convey the understanding of the causes for the distribution. A similar label of low (or high) fines/OC on Figure 4-1 areas where the TEQ exceeds the REV shall be included to provide a more coherent understanding of the data.

31. (Section 5.2.3.3.1, p. 5-26): The text states that there were matrix interference issues in regards to the analysis of the PCB Aroclors within the northern impoundments. There were detection limits of almost three orders of magnitude different from samples collected out of the same boring. The report shall include an explanation (lab chemist) on why there

were problems with the Aroclor analysis.

32. (Section 5.2.3.3.3, p. 5-30): The reference to Figure 5-17 states that it portrays TEQ. The graphed data has no label of units on its vertical axis, however, and the vertical axis appears to represent the relative TEQs, as compared to the mean in the Northern Impoundments. On the same Figure 5-17, the preliminary investigation perimeter data apparently excludes the Northern Impoundments data. The report shall provide explanations for this as well as accurate labeling of Figure 5-17.

33. (Section 5.2.4, p. 5-32): The data summaries are limited to toxicity equivalency factors for mammals only. The discussion and the summary tables shall also present the tissue dataset in terms of toxicity equivalency factors for birds and fish or provide an acceptable rationale for limiting the evaluation to mammals in this manner.

34. (Section 5.2.4, p. 5-32; and on p. 5-40): The section fails to note the major uncertainties in tissue contaminant data relating to the size, age, and sex of the specimens; ranges; stomach contents (food sources); and other key variables. For example, TDSHS study *Analysis of Risk from Consumption of Fish Taken from Toledo Bend*, 1995, shows the relationship between fish length and mercury levels at that site. If the fish caught from sampling were half the length of those typically consumed, the measured mercury content used for the tissue risk analyses could be several fold lower than the concentrations consumed by receptors. The uncertainties in the deductions derived from the limited scope of studies performed shall be described in more detail.

35. (Section 5.2.4.1.6, p. 5-37): Reference is made to Figure 5-18, which states that transect locations are on Figure 2-6, but Transects 7 and 8 are not shown on Figure 2-6. The report shall include all transects on the figure, or identify their location in another figure.

36. (Section 5.3.2, p. 5-49): Regarding the sampling objective of determining whether vertical gradients in concentrations of dioxins and furans in pore water of the TCRA armored cap exist, the draft text states that "these data indicate the absence of vertical concentration gradients of dissolved 2,3,7,8-TCDD or 2,3,7,8-TCDF in the pore water within the TCRA armored cap." There is additional text stating that "these results indicate the TCRA armored cap is effective in eliminating any release of dioxins and furans associated with waste materials within the northern impoundments, and the TCRA armored cap is also effective in reducing or eliminating the potential release of dissolved-phase dioxins and furans from the northern impoundments into the surface water of the river." The text shall be modified to indicate that these results reflect conditions at the time of sampling and is not conclusive that releases of dioxins and furans associated with waste materials will not occur after the armored cap has been in place for some time. It is possible that if a vertical gradient does exist, it would be more apparent after any large pore spaces are filled with sediment fines.

37. (Section 5.4.1.2, p. 5-54): The interpretation of Figure 5-24 shall provide an explanation for the wide variation in octachlorinated dibenzo-p-dioxin (OCDD) content for the samples with significant TCDD. Additionally, the figure does not appear to show the black circles. The figure shall be clarified.

38. (Section 5.5.1, p. 5-70): The report states that  $10^{-4}$  is an acceptable cancer risk. For any remediation, the EPA will select the relevant protective cancer risk level, between  $10^{-4}$  and  $10^{-6}$ , in the Record of Decision. The report shall include quantitative risk analyses for receptors with any cancer risk greater than  $10^{-6}$ . The slope factor approach, in addition to the target hazard quotient approach, shall be reported, and PCL calculations based on  $10^{-6}$  shall be included in the RI report.

39. (Section 5.5.2.5.1 p. 5-82): The report shall state definitively to what extent Transect 3 has been capped by the TCRA.

40. (Section 5.5.2.5.1, p. 5-82): In the last paragraph of this discussion, there is a statement that "concentrations of 2,3,7,8-TCDD in clam tissue from two of five samples directly adjacent to the upland sand separation area exceed a threshold of histological effects in individual female oysters." The text shall be modified to state a threshold of "histological effects related to impaired reproduction and larval survival" or simply "histological effects related to impaired reproduction."

41. (Section 5.5.2.5.5, p. 5-84): The summary shall acknowledge that the reptile risk assessment was a qualitative evaluation.

42. (Section 5.6.3, p. 5-90): The Fate and Transport Report estimates that some areas have net erosion and some areas have net deposition. While the isotope dating data are useful, the text of this section fails to provide a balanced description, noting that erosion occurs in some areas and that during high flow conditions and storm surges, different erosion and deposition patterns from those shown likely occur. The report shall be modified to reflect such limitations on the interpretation of the deposition data presented. Further, the report states that vertical profiles of cesium-137 and lead-210 produce a range of net sedimentation rates (NSRs) of 0.4 to 3 cm/year at six of the core locations. However, the cesium-137 data fails to provide any estimate of NSR in any of the eight cores. This statement shall be revised to reflect the fact that NSRs at six of the eight cores were based only on lead-210 data. The report shall discuss the uncertainty of model predictions in light of the data limitations.

43. (Section 5.6.5, p. 5-97): The report states that, overall, the calibration and validation of the fate and transport model demonstrate that the model is able to simulate the hydrodynamics within the study area with sufficient accuracy. The planned approach to the modeling effort was to collect river condition data during times of high flow conditions to improve the accuracy of the model calibration. However, there was little rainfall during the study period and mostly low-flow conditions in the river, so there were no significant high-flow conditions to measure. The report shall discuss the lack of data for high-flow conditions and how it may impact the accuracy and uncertainty of the model results, especially in light of increased sediment transport during high-flow conditions.

44. (Section 5.7.4.2, p. 5-108): The likelihood of actual pathway completion to pore water (sediment) or surface water is considered low because of the assumed low hydraulic conductivity of the waste. The absence of significant congener concentration in sample analyses of the top six inches of the TCRA "porewater" is interpreted to signify that there are no releases occurring

now. However, the TCRA does not comprise a complete impermeable barrier between the waste and the sediment/surface water at their interface. Long-term testing of "porewater" is required to insure that this pathway does not become a future conduit for transfer of contamination.

45. (Section 5.8, p. 5-110): The first sentence of the second paragraph shall be modified to remove the words, "or ecological" since the PCLs are derived for human health pathways only.

46. (Section 6.1, p. 6-3): The additional site historical information below shall be incorporated into the existing narrative for the purpose of supplementing the aerial photo interpretation. On September 13, 1965, McGinnes Industrial Maintenance Corporation took over the settled waste disposal from the previous operator (pg 1, TSDH, 1966). The "... older site on the south side of the Highway ..." was "... used prior to McGinnes Corp. taking over the operation and appears to consist of a pond covering between 15 and 20 acres ..." (pg 2, TSDH, 1966). In 1966, the depth of water in parts of the south pond was reported to range between 3 to 5 feet (pg 3, TSDH, 1966). The southern waste pond was filled and taken out of service by 1966 and the western waste pond was filled by 1966.

47. (Section 6.1, p. 6-4): The report states that available historical aerial photographs were not possible to obtain due to the compressed schedule for the RI Report. The report shall clarify which aerial photographs are being referred to, their date and location covered, whether they are currently available, and the timeframe needed to obtain them.

48. (Section 6.1.1, p. 6-4): In the second paragraph, second line, "an" shall be changed to "a" before "historical".

49. (Section 6.1.4.2.1, p. 6-13): In the 1<sup>st</sup> and 2<sup>nd</sup> lines on page 6-13 the reference to "substances" and "materials" shall be changed to "wastes".

50. (Section 6.1.4.2.2, p. 6-13): On the 3<sup>rd</sup> line of 1<sup>st</sup> paragraph the "materials" reference shall be changed to "wastes".

51. (Section 6.2.2, p. 6-28): The reference in the text "Miller 2011" is missing the proper suffix for this reference and shall be corrected.

52. (Section 6.3.3, p. 6-41): In the next to last sentence in paragraph 2 the references to "materials" and "substances" shall be "waste" if referring to the 1997 TNRCC Agreed Order.

53. (Section 7.1, p. 7-3): The discussion states that implementation of the TCRA has eliminated the associated secondary transport mechanisms resulting from erosion due to the river flowing over the wastes and due to storm related sediment resuspension. The discussion continues that as a result of the TCRA, RAO 1 has been achieved for the northern impoundments. This discussion does not mention the apparent erosion of the armor rock on the west side of the TCRA in July 2012. Further, the TCRA is not the final long term remedy, which will be selected in the Record of Decision. The report recognize the erosion that occurred, and shall state that the TCRA is preventing release of dioxins and furans for the time being, and that the final remedy to achieve RAO 1 in the long term will be selected in the Record of Decision.

54. (References): The Reference section is missing a reference for ASTM D-5084, which shall be included.

55. (Table 4-3): The table shows in several instances a 0% detection frequency, yet minimum, maximum, and mean concentrations are provided. The table shall include a footnote to explain this.

56. (Figure 3-5): The Pleistocene Beaumont Formation is represented by two colors. The figure shall be clarified to explain the difference between the two areas/formations.

57. (Appendix D, Draft Baseline Ecological Risk Assessment for the Peninsula South of I-10): For invertivorous birds (killdeer as measurement receptor), the lowest-observed-adverse-effects level (LOAEL)-based hazard quotients for lead and zinc were greater than one. For lead, the central tendency (i.e., based on mean concentrations) LOAEL-based hazard quotient was two, and the reasonable maximum (i.e., based on 95% UCL concentrations) LOAEL-based hazard quotient was eight. For zinc, the central tendency LOAEL-based hazard quotient was one, and the reasonable maximum LOAEL-based hazard quotient was three. The BERA conclusions state that baseline risks to individual terrestrial invertivorous birds represented by the killdeer from exposure to lead and zinc are present, and risks to terrestrial bird populations from exposures to lead and zinc may be present. The discussion also cautions that the risk management approaches regarding these metals should consider a number of uncertainties (e.g., exposure estimates, bioavailability, toxicity under field conditions relative to potential toxicity in the laboratory, and actual tissue concentrations of food items). Based on probabilistic analyses of exposure and risk, the BERA also states that the probability that exposure to these metals will exceed the respective LOAEL is 88% for lead, and 68% for zinc. The uncertainties associated with these metals/exposure pathways are not unlike those typically outlined in any "desktop" ecological risk assessment where site-specific tissue data is not available. With this in mind, the spatial distribution of the elevated metals concentrations, site conditions, infrastructure, and maintenance activities (e.g., routine mowing) are also important risk management considerations and shall be reflected in this discussion.